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Before the  
FEDERAL COMMUNICATIONS COMMISSION  
Washington, D.C. 20554

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FCC 83-154  
33147

In the Matter of )  
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Amendment of Parts 2 and ) BC Docket No. 82-536  
73 of the Commission's Rules )  
Concerning Use of Subsidiary )  
Communications Authorizations )

FIRST REPORT AND ORDER

Adopted: April 7, 1983 ; Released: May 19, 1983

By the Commission: Commissioner Fogarty absent.

I. Introduction

1. On August 4, 1982, the Commission adopted a Notice of Proposed Rule Making ("Notice") which set forth proposed amendments of Parts 2 and 73 of the Commission's Rules concerning use of the subsidiary communications authorizations (SCA). <sup>1/</sup> The Commission issued the Notice to determine whether the restrictions imposed by our rules have artificially limited the use of subcarriers, and thereby caused this available resource to remain underutilized.

2. The Notice contained non-technical, technical and procedural proposals. The non-technical proposals were: to abolish the current requirement that subcarriers be used only for transmitting material that is of a "broadcast nature;" and to permit subcarrier operation on a 24-hour basis regardless of whether the main channel is on-the-air. The technical proposals were: to increase the upper limit restricting the instantaneous sidebands of subcarriers in the FM baseband from the present maximum of 75 kHz to a maximum of 99 kHz; increase the maximum modulation deviation for FM broadcast stations when using subcarriers; and remove the requirement that only frequency modulated subcarriers be transmitted. Finally, two proposals were made in the procedural category to: eliminate the program log requirements for subcarriers; and eliminate the requirement for a formal subcarrier application (Form 318).

<sup>1/</sup> 47 Fed. Reg. 36235 (1982).

## II. Analysis of the Record

### A. Comments on Non-technical Proposals <sup>2/</sup>

3. The majority of the commenting parties favor allowing non-broadcast uses of FM subcarriers, but their attention focuses on the issue of how services that resemble traditional common carrier services, like paging, should be regulated. <sup>3/</sup>

4. More specifically, National Public Radio ("NPR") believes that imposing common carrier regulation on FM subcarriers used for paging services is neither appropriate nor necessary. It argues that FM licensees would continue to be regulated under Title III of the Communications Act. It sees subcarrier use as "ancillary" to the operation of the existing FM broadcast station and asserts that the licensee must remain responsible for the material transmitted on the subcarrier. The test for common carriage, according to NPR, was articulated in National Association of Regulatory Utility Commissioners v. F.C.C., 525 F.2d 630 (D.C. Cir. 1976), cert. denied, 425 U.S. 992 (1976) (hereinafter referred to as "NARUC I"). The Court therein set forth a two pronged test of whether a communications service should be considered common carriage: whether there is a legal compulsion to serve the public; and whether there is an "indifferent holding out to the eligible user public." NPR contends that subcarrier offerings are new and untried, will be subject to vigorous marketplace forces, and will only be used at the discretion of the licensee. Thus, there is no compelling reason why an FM licensee must use its subcarrier to serve or make its facilities available to the public at large.

5. NPR does note that the Communications Amendments Act of 1982, may have altered the NARUC I test at least for common carrier land mobile services. <sup>4/</sup> NPR argues that any new standard applies only to "mobile

<sup>2/</sup> Several parties were concerned with providing protection for radio reading services because they fear that nonprofit organizations are unable to compete in the economic marketplace with commercial ventures seeking access to FM subcarriers. For the most part, radio reading services are provided on noncommercial FM stations. Under these circumstances, on November 4, 1982, the Commission issued a public notice stating that the Reports and Orders in BC Docket Nos. 82-536 and 82-1, the proceeding proposing authorization of commercial use of subcarriers for public broadcasters, would be considered concurrently. Thus, the comments on the radio reading service issue that were filed in this proceeding are considered and resolved in the companion Report and Order in BC Docket No. 82-1 adopted this date.

<sup>3/</sup> Reply comments for the FM SCA paging issue were extended from November 17, 1982 to January 16, 1983. Order Extending Time for Filing Comments to Notice of Proposed Rule Making, BC Docket No. 82-536, released October 7, 1982.

<sup>4/</sup> Pub. L. No. 97-259, 96 Stat. 1087 (codified at 47 U.S.C. §331, et. seq.)

services," that are defined as services "carried on between mobile stations or receivers and land stations, and by mobile stations communicating among themselves, and includes both one-way and two-way radio communications services." 5/ NPR argues that "notwithstanding any provision of a paging service that may fall within this definition, the broadcaster's offer of a subcarrier facility to an operator cannot conceivably be deemed to be engaging thereby in the provision of a mobile radio service. . . ." Furthermore, in its reply comments, NPR argues that the 1982 amendment conferred maximum discretion on the Commission in determining whether a service is common carriage and whether and how it should be regulated. According to NPR, suppliers of facilities -- as distinct from services -- are not common carriers. It cites a recent Commission action that concluded that entities that hold out services and equipment to others were not themselves offering a communications service, thus requiring regulation as common carriers. 6/ Based on the above, NPR concludes that offerers of subcarriers are simply providing a facility to others, and not a service. Therefore, they are not engaging in common carriage.

6. Similarly, National Radio Broadcasters Association ("NRBA") argues that FM licensees would be offering paging services on a selective, rather than an indiscriminate basis. Moreover, NRBA argues that in adopting the new Section 331, Congress determined that private land mobile services, including paging services, should not be governed by common carrier regulations. Some parties, such as the National Association of Broadcasters ("NAB"), the Joint Reply Comments of FM Radio Broadcast Licensees, and American Broadcasting Companies, Inc. ("ABC") dismiss as being without merit the argument that FM licensees providing subcarriers for paging operators should be regulated as radio common carriers. Broadcast licensees, as required under Section 73.295 of the Commission's rules, are "to retain control over all material transmitted over the station's facilities with the right to reject any material which it deems inappropriate or undesirable." ABC argues that this rule distinguishes FM licensees from common carriers -- the latter have no influence over the content of transmissions.

7. On the other side of the issue, the National Association of Business and Educational Radio, Inc. ("NABER") supports elimination of the subcarrier restrictions, but it proposes that all subcarriers used for the provision of land mobile services should be subject to the licensing requirements of either private or common carrier services, depending upon the functional nature of the proposed system. NABER contends that the provision of paging and other land mobile services are wholly outside the bounds of broadcast authorization, and the Commission routinely requires other entities to obtain a specific authorization to provide such services. According to NABER, the legislative history of the Communications Amendments Act of 1982

5/ Pub. L. No. 97-259, §120(b)(2), 96 Stat. 1097.

6/ Cooperative Use and Multiple Licensing of Stations in the Private Land Mobile Radio Services, 89 F.C.C. 2d 766, 773-74 (1982).

indicates that the NARUC test of common carriage has been superseded by the newly formulated definition. NABER contends that the newly enacted legislation regards the activity in which the specific party is functionally engaged as dispositive. NABER states that paging services are unequivocally defined as a mobile service. NABER concludes that the Commission should make subcarrier allocations available for uses other than broadcast, but it proposes that these allocations be made available to users of private land mobile radio as a whole, and not be limited to broadcast entities.

8. L&L Services, Inc., Common Wealth Telecommunications, Inc., AT&T and Metromedia believe traditional radio common carriers would be prejudiced because FM subcarrier paging services would not be regulated while paging services classified as radio common carriers are regulated. They argue that paging services utilizing FM subcarriers must be subject to the same state and federal regulatory treatment as is applied to existing radio common carrier paging services.

9. MCI Airsignal, Inc., also raises the question of competitive inequality due to technical facility differences between radio common carriers and FM stations. Because of these differences, MCI Airsignal argues that subcarriers pagers would cover an area many times larger than traditional radio common carriers. MCI Airsignal recommends that the Commission establish a new service (highpower paging), and permit only broadcasters or their designees to apply for licenses in that service. MCI Airsignal argues that the paging service that would be provided over FM subcarriers should be no different from the paging service provided over an allocated paging channel insofar as Title II of the Communications Act is concerned.

10. The Amaturio Group, Inc. expresses concern that the exemption of non-broadcast subcarrier paging services from common carrier regulation would generate legal controversies that could delay the implementation of a beneficial new public service. Current Commission rules provide significant distinctions between common carrier and non-common carrier paging services in terms of the permissible methods of interconnection with the public switched telephone network (PSTN). Thus, Amaturio suggests that the Commission allow the licensee of an FM broadcast subcarrier providing paging services to elect whether to provide a common-carrier or a non-common carrier service. Licensees opting to operate as common carriers would be subject to all pertinent rules found in Part 22 of the Commission's regulations. 7/ Licensees opting to provide non-common carrier services on their subcarriers

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7/ For example, licensees who elect common carrier regulation would be subject to the provisions covering eligibility, annual reporting requirements, maintenance requirements, operator requirements, permissible communications, priorities of service, station identification, discontinuances of service, tariffs, and state regulations which govern common carrier paging operations.

would be subject to the pertinent regulations found in Part 90 of the Commission's rules regarding private radio services. 8/

11. Telocator Network of America (Telocator) contends that the existence of a competitive marketplace in paging will assure that service offerings will exhibit economic "indifference" and, hence will constitute common carriage. Additionally, Telocator believes that the courts have explicitly and repeatedly recognized that the concept of common carriage is embedded in the Communications Act, and that concept is relatively objective and not affected by the underlying character of the facilities or their use for other purposes. Telocator concludes that if the subcarrier use meets the objective legal test of common carriage, it may not be considered otherwise.

12. Telocator also argues that common carrier status is not changed by the proposed requirement that the broadcast station licensee retain control over all material transmitted over the station's facilities. According to Telocator, such control is unrealistic since paging service is a real-time service, simultaneous transmission of voice over the airwaves to the paging receiver. Under these circumstances, Telocator does not believe that the concept of "content control" could have any basis in reality. Moreover, Telocator contends that content control over subcarriers used for paging is an apparent violation of §605 of the Communications Act. 9/ For paging services, the sender is neither the FM licensee nor the paging service subscriber, but rather is the person desiring to contact the paging service subscriber. Therefore, by statute, FM licensees would not be able to exercise the right of control over paging services utilizing subcarrier's. However, Telocator argues that, if the Commission decides to permit non-broadcast uses of subcarriers, the more traditional use "of a broadcast nature" should still retain a priority, and should be permitted to "bump" non-broadcast uses.

13. Telocator also contends that FM subcarriers are not a spectrum efficient means of providing paging services, as compared with the transmission facilities now licensed for common carrier use. Telocator argues that in a particular area, an FM broadcast station "occupies" 1400 kHz of spectrum; the station's 200 kHz channel plus the three upper and three lower adjacent channels. Telocator then evaluates the spectrum use efficiency of

8/ For example, non-common carrier paging operations on SCA subcarriers would be subject to the provisions in Part 90 of the rules regarding eligibility, permissible communications, methods of interconnection, operator requirements, cooperative use provisions, station record requirements, transmitter control provisions and interconnection restrictions that pertain to "private" radio paging operations.

9/ With the exception of transmissions intended for the general public, distress calls or amateur and citizens band calls §605 provides that "No person not being authorized by the sender shall intercept any radio communication and divulge or publish the existence, contents, substance, purport, effect, or meaning of such intercepted communication to any person."

the FM station using a 79 kHz subcarrier baseband range as the percentage ratio of 79/1400 for approximately 6%. According to Telocator, the proposed subcarrier baseband extension from 75 to 99 kHz would realize only an increased spectrum efficiency of about 2%. Telocator then argues that diverting the FM broadcast spectrum to non-broadcast subcarrier services must be discussed in relationship to the Commission's ongoing proceeding in BC Docket No. 80-90. This, Telocator claims, would permit a much more efficient use of the FM spectrum by permitting FM stations to be licensed to serve vast areas of land now reserved for stations operating with less than maximum power for their class and by decreasing the distance separation between stations of certain classes.

#### B. Discussion of Non-Technical Proposals

14. Upon review of the entire record in this proceeding, we believe that the permissible use of FM subchannels should be expanded to include non-broadcast as well as broadcast-related material. Moreover, subchannel use should not be limited to times when the main channel is on the air. Those commenters that opposed non-broadcast related subchannel use did so on grounds that it would unfairly compete with other communications services. We are aware of this situation, and, to the extent practical, we have endeavored to create an environment whereby such competing services would be treated in an evenhanded manner by the Commission.

15. In changing our rules to authorize non-broadcast related uses of FM subchannels, we are particularly impressed with the potential for additional communications services without the need for additional allocations of valuable spectrum. As we indicated in the Notice, subcarriers become available when FM stations utilize multiplex techniques to divide the usable spectrum into main and subchannels. Although the intelligence carried on a subchannel is not necessarily related to the main channel, the subchannel itself is part and parcel of the bandwidth each FM station is authorized to use. Thus, channels of communication are available and can be used only if an FM licensee chooses to do so. However, we found that substantial portions of the spectrum available for subchannels were unused. To the extent that this situation was a result of Commission rules that unduly restricted subchannel usage, this otherwise available spectrum was being wasted. Elimination of such restrictions would permit the beneficial use of these subchannels, potentially eliminating waste. Using spectrum that was originally allocated to the FM service, licensees may provide additional communications service, without materially affecting the provision of their main channel

programming. Such efficient use of the spectrum can only enure to the benefit of the public in general. 10/

16. In this regard, we note that there is a present and growing demand for additional spectrum to provide the same type of services that could be rendered on FM subchannels without disturbing the primary allocation of the FM broadcast band. For example, in General Docket No. 80-183, the Commission received estimates of future demand for paging services and allocated forty additional paging channels each for private and common carrier systems. Paging Systems-DPLMRS, 89 FCC 2d 1337 (1982); see also, Notice of Proposed Rule Making (Gen. Docket No. 80-183), 45 Fed. Reg. 32013 (May 15, 1980). However, Telocator, among other commenters in that proceeding, argued that additional spectrum would be necessary to meet anticipated demand for paging. Paging Systems-DPLMRS, supra at 1338. FM subchannels could, to some extent, alleviate those spectrum demands for future paging needs.

17. Therefore, we will change our rules to permit the use of FM subchannels for broadcast and non-broadcast related purposes. The commenting parties have provided no information to indicate that such expansion of permissible use would be inconsistent with the continued provision of quality, or even enhanced, FM service to the general public. Indeed, some parties have opined that the use of subchannels for commercial purposes could provide needed financing to marginal or failing stations, thus preserving the service for which the license was originally granted.

18. By authorizing materials of a non-broadcast nature to be transmitted over FM subchannels, stations will be permitted to engage in service to the public at large, limited segments of the public with special interests, individual firms, organizations, and persons. Examples of such services include: paging, distribution of inventory, price and delivery information by businesses, bus dispatching for local and regional transportation and police communication to all substations. This broad authorization allows licensees to realize the most efficient and effective use of the FM baseband by providing a wide variety of subcarrier services.

10/ Telocator argues that FM SCA's are an inefficient use of spectrum and even the expanded baseband will not substantially improve the efficiency of an FM station's spectrum usage. That FM stations "occupy" more spectrum than some common carrier stations is a reflection of the signal quality of their primary broadcast service. This should not prevent us from permitting greater efficiencies within the allocated FM bandwidth. Thus, under the changes adopted herein, an FM station could utilize semi-discrete quadraphonic broadcasting to enhance its entertainment programming to its general audience; provide radio reading service on a subchannel to serve the visually handicapped; permit the more efficient operation of a utility company through utility load management services to the benefit of the utility's customers and energy conservation; and provide paging services to those that desire such specialized communications services. All of these services could be provided in the same spectrum that was originally allocated for monophonic FM.

However, such services may be offered in direct competition with other, non-broadcast, radio licensees. Many commenters were concerned that competition from an FM subchannel would place them at an unfair disadvantage by virtue of the Commission's mode of regulation of that FM licensee and its subchannel use.

19. In this regard, we need not concern ourselves with the provision of "broadcast-related" services on a subchannel. Subcarriers used to enhance main channel programming with stereo or quadraphonic sound, those used for station cuing, control and meter reading, and the provision of "narrowcasting" services such as functional music (Muzak), radio reading services, foreign language programming and various informational and instructional programming are broadcast related, and provision of such services does not raise any new issues of appropriate regulation.

20. However, other subchannel uses may be akin to services being provided by licensees in the private radio services and/or the common carrier services. With regard to such services that may to some extent be substitutable for services of licensees in the private radio and/or common carrier services, we are sensitive to the concerns of the commenters that like services be treated equally by the Commission. Therefore, the changes we are adopting today will insure that, where such considerations of equity apply, FM subchannels used for non-broadcast related communications will be treated by this Commission in the same manner, with all the same benefits, obligations and responsibilities as the providers of similar services. Thus, with regard to non-broadcast related uses of FM subchannels, it will be necessary to determine whether the service offered constitutes private or common carriage under the applicable statutes and case law.

21. In NARUC I, the Court specifically stated that a carrier will not be considered a common carrier where its practice is to make individualized decisions, in particular cases, whether and on what terms to deal. 525 F. 2d 630 at 641 (D.C. Cir. 1976), cert. denied, 425 U.S. 922 (1976). The Court stressed that a company's clientele was not necessarily dispositive of the issue since common carriers in particular situations need not serve the entire public and private carriers may serve a significant portion of the population. The Court then reasoned that:

"Since given private and common carriers may therefore be indistinguishable in terms of the clientele actually served, it is difficult to envision a sensible line between them which does not turn on the manner and terms by which they approach and deal with their customers." Id. at 642.

Assuming that no legal compulsion is present that requires an entity to offer its services on an indiscriminate basis, the Court indicated that a finding of common carrier status would turn on whether a particular entity actually operates as a common carrier, that is, whether the carrier "undertakes to carry for all people indifferently."



22. The Court then listed several factors indicative of whether the service offerings of a particular carrier could indeed be classified as common carriage. The establishment of medium-to-long contractual relationships with customers was considered inconsistent with the concept of an indifferent holding out. The Court stated that a private carrier could be expected to serve a relatively stable clientele, with terminations and new clients the exception rather than the rule. Not holding out facilities indifferently would mean that the service provider would desire and expect to negotiate with and select future clients on a highly individualized basis. Further, the existing demands for a licensee's spectrum and the licensee's methods of operation may be sound bases for accepting or rejecting an applicant. Thus, a licensee's use of the facilities may make an indifferent holding out inherently impractical or impossible. Such activity would necessarily preclude common carrier classification. 525 F. 2d at 643.

23. However, with regard to land mobile services, the Communications Amendments Act of 1982, Section 120, establishes a demarcation between private and common carrier land mobile services, and indicates that the test contained in the new Section 331(c) of the Communications Act is intended to supersede the NARUC I standard. Public Law No. 97-259, 96 Stat. 1087. We agree with the commenters that argue that the test in the new legislation would apply to some of the communications services that could be offered on FM subchannels. The Act defines a "Mobile Service" as "...a radio communication service carried on between mobile stations or receivers and land stations, . . . , and includes both one-way and two-way radio communication services." Public Law 97-259 at Section 120(b)(2), 96 Stat 1097, 47 U.S.C. 153(n). It is clear that potential FM subchannel services such as paging would therefore be governed by the new legislation, and such services will be judged by the test in the new Section 331(c). The new statutory test is based on the manner in which a multiple licensed or shared private land station is interconnected with a telephone exchange or

interexchange service or facility. <sup>11/</sup> See also, H.R. Rep. No. 765, 97th Congress, 2nd Session, pp. 52-56 (1982). <sup>12/</sup> The statute also makes it clear that if it is a private system, it is exempt from state and local regulation. 47 U.S.C. 331(c)(3).

24. Therefore, the determination as to whether a particular service offered on an FM subchannel is private or common carriage will be made in accordance with the NARUC I test for all non-broadcast related services except mobile radio. For mobile radio services, the new Section 331(c) standard will govern.

25. Once a licensee has determined that the proposed service is common carriage under the appropriate standard, it must seek authorization to provide that service from the Common Carrier Bureau (and state commissions, as appropriate). Because existing broadcast licensing procedures may not afford the needed mechanism by which necessary Commission determinations related to common carrier service offerings can be made, we will require any licensee intending to provide such services with subcarriers first to seek authorization by filing a suitable request under Parts 21 or 22, as appropriate. See 47 CFR Parts 21 and 22. Public notice will be given of each such request received, and a 30-day period will be afforded to all parties wishing to file comments in connection therewith. After considering any comments submitted and the substance of the underlying request, the Commission will issue a decision disposing of the matter. It is our intention that, in seeking such authorizations, the FM subchannel operator will be in the same position, entitled to the same privileges and subject to the same obligations and regulations as a traditional offerer of such services. For example, the Commission has established as a general matter that competition in the provision of certain common carrier services is in the public interest. See e.g., Specialized Common Carrier Decision, 29 F.C.C. 2d 870 (1972), aff'd sub nom. Washington Utilities and Transportation Commission v. FCC, 513 F. 2d 1142 (9th Cir. 1975); Graphnet Systems, Inc., 71 F.C.C. 2d 471 (1979), aff'd sub

<sup>11/</sup> New Section 331(c)(1) of the Act provides that "...private land mobile service shall include service provided by specialized mobile radio, multiple licensed radio dispatch systems, and all other radio dispatch systems, regardless of whether such service is provided indiscriminately to eligible users on a commercial basis, except that a land station licensed in such service to multiple licensees or otherwise shared by authorized users (other than a nonprofit, cooperative station) shall not be interconnected with a telephone exchange or interexchange service or facility for any purpose, except to the extent that (A) each user obtains such interconnection directly from a duly authorized carrier; or (B) licensees jointly obtain such interconnection directly from a duly-authorized carrier."

<sup>12/</sup> The Commission's interpretation of the test in the new legislation will be fully explored in our reconsideration of the Second Report and Order, Docket No. 20846, 89 F.C.C. 2d 741 (April 8, 1982), and our treatment of land mobile services herein is expressly subject to the outcome of that proceeding.

nom. Western Union Telegraph Co. v. FCC, 665 F. 2d 1112 (D.C. Cir. 1981); Paging Systems--DPLMRS, 89 F.C.C. 2d 1337 (1982); and MTS and WATS Market Structure, 81 F.C.C. 2d 177 (1980). Therefore, our policy is that applications to provide common carrier services from qualified applicants will be granted unless there is some basis to believe that such grant "is likely to produce results that conflict with the goals of the Communications Act." MTS/WATS, supra at 200. This policy applies equally to FM subchannel operators proposing to provide these common carrier services.

26. FM broadcast licensees seeking to provide private carrier service on subcarrier facilities must notify the Licensing Division of the Private Radio Bureau at Gettysburg, Pennsylvania, 17325, by letter, prior to initiating service. In the letter, they must certify that their facilities will be used in this regard only for permissible purposes. See 47 CFR Parts 90 and 94. When providing land mobile service, they must also certify that service will be offered only to users eligible under Part 90 of the Commission's Rules, and that any interconnection of the station with a telephone exchange or interexchange service or facility will be obtained in accordance with new Section 331 of the Communications Act, supra. Such notifications will not give rise to a comment period, and no separate authorization will be issued by the Commission. As in the case of common carrier services, the FM subchannel operator offering a private service will be in the same position, entitled to the same privileges and subject to the same obligations and regulations as a traditional offerer of such services.

27. In all cases, involving either private or common carrier services, the applicant will not be seeking approval for the technical facilities of the FM station or the subchannel. The Commission regards FM subcarrier use as a secondary privilege that runs with the primary FM station license. That right is conferred on the primary station licensee only. 13/ In this regard, it should be noted that an FM broadcaster that elects to use a subchannel for private or common carriage remains a broadcaster for all other purposes. Only the use of the subchannel for nonbroadcast related purposes would be regulated in accordance with private radio or common carrier regulations. See, NARUC v. FCC, 533 F. 2d 610 (D.C. Cir. 1976).

28. We also recognize that there may be situations in which the delivery of services via subcarriers enjoys a competitive advantage over other carriers by virtue of the greater service area of some FM stations. Although several commenting parties alluded to this possibility they chose not to

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13/ A licensee may choose to lease its subchannel to an entity that will provide a private or common carriage service. In such cases, the lessee may seek the appropriate authorization, but the primary licensee remains responsible for the technical operation of the transmitting facilities, including the subchannel.

supply the technical information necessary to evaluate it. <sup>14/</sup> However, in an article in the March 1983 issue of Telocator, Volume 7, No. 3, the engineering firm of Sachs/Freeman Associates, Inc. concluded that existing authorized paging facilities would serve a greater area than subchannels on Class A FM stations, and would serve an area approximately equal to subchannels on a Class B FM station. Only subchannels on a Class C station could materially outperform the traditional paging facilities, but even then, the Class C station would have to be operating with an antenna having a height above average terrain (HAAT) of at least 500 feet. <sup>15/</sup> Of approximately 5,000 currently authorized FM stations, only 1,173 are Class C, and only about 20% of those Class C stations are operating at or near maximum facilities. <sup>16/</sup> On the basis of the Sachs/Freeman study, it is reasonable to assume that any competitive disadvantage to traditional paging systems would only occur with regard to those Class C stations that exceed the equivalent of 100 kW at 500 feet HAAT. <sup>17/</sup> If we were to limit the effective transmitting power of subcarrier service offerers to equal that of competing carriers, we would be diminishing many of the spectrum efficiencies that we hope to obtain through this proceeding. On balance, therefore, we believe that any possible inequity in technical facilities is overshadowed by the public interest benefits to be derived from innovative and spectrum-efficient subcarrier services that are possible under the decision herein. See, 47 USC 303(g) which provides, inter alia, that the Commission should "...generally encourage the larger and more effective use of radio in the public interest."

<sup>14/</sup> Telocator did allege that an FM subcarrier would cover more area than a traditional paging transmitter by virtue of the higher power limits. This simplistic approach ignores significant factors such as modulation levels, propagation differences due to different spectrum used, etc. Thus it cannot form the basis of any conclusions on the relative coverage areas of existing paging systems and FM subcarriers used for paging.

<sup>15/</sup> Class C FM stations are authorized to operate with an antenna height of up to 2000 feet above average terrain.

<sup>16/</sup> A study performed in preparation for the Notice of Proposed Rule Making in BC Docket No. 80-90 indicated that, of 981 Class C FM stations that were authorized in 1979, only 147 were at or near maximum facilities, and 608 had technical facilities equal to or less than 100 kW effective radiated power with antennas 500 feet HAAT. Applying these proportions to the currently authorized Class C FM stations, only about 450 would exceed the service area of traditional paging stations, only about 235 are at or near maximum facilities.

<sup>17/</sup> However, paging systems can expand their coverage areas with multiple transmission facilities. Although such expansion is not without cost, a paging system can thereby provide coverage equal to or better than that provided by a Class C FM station's subcarrier.

29. Finally, we see no reason to continue to limit subchannel operation to times when the main channel is on the air. When the rule was originally adopted, it was felt that extensive use of subchannels for narrowcasting while the main (broadcast) channel was off the air would subvert the purpose of the spectrum allocation for FM broadcasting. Since that time, we have adopted rules which prescribe minimum hours of operation for FM stations. See Sections 73.1740 and 73.561(a). Moreover, the Notice indicated that FM stations considered in this proceeding were on the air an average of 20.2 hours per day. Under these circumstances, there appears to be little danger that extended hours for subchannels would subvert the primary purpose of the FM band. Accordingly, and in the absence of any comments suggesting the contrary, we will eliminate the time restriction on subchannel operation. 18/ This action will increase the communications capabilities of FM subchannels by approximately 30 percent. (See Notice, supra, at paragraph 16.)

### C. Technical Proposals

30. As briefly described earlier, the Notice proposed changes in three technical areas. The proposals were:

- (a) to increase the upper limit restricting the instantaneous sidebands of subcarriers in the FM baseband from the present maximum of 75 kHz to a maximum of 99 kHz;
- (b) to increase the maximum modulation deviation for FM broadcast stations using multiple subcarriers; and
- (c) to remove the requirement that only frequency modulated subcarriers be transmitted.

The Commission believed these proposals would expand the capacity for multiple subcarrier services and enhance the flexibility with which subcarriers could be used. We will discuss general comments on the technical proposals first, before turning to the individual proposals.

31. NPR submitted technical data from its experiment with Station WETA-FM demonstrating that the proposals were technically feasible. Bonneville International Corporation ("Bonneville") agreed with the experience of NPR stating that the operation of an additional FM subcarrier would present no degradation of the main channel signal. Westinghouse Broadcasting and

18/ In response to the concern of the staff of KMWU concerning station identification procedures for subcarrier operations when no main channel programming is transmitted, the hourly station identification procedures for the main channel would still apply. The identification announcement could be initiated by the transmitter duty operator, or by means of a time clock actuated recorded identification announcement.

Cable, Inc. ("Westinghouse"), supplied an engineering report to support its contention that the subcarrier standards may be modified without adversely affecting main channel performance or increasing the potential of interference to adjacent-channel stations. An engineering statement submitted as an appendix to the comments of the Amaturio Group, Inc. also concluded that the proposals should be adopted. The NAB supported the proposals but argued that the Commission has a basic duty to ensure that the expansion of subcarrier uses will in no way jeopardize the technical quality of main channel service.

32. A few commenters suggested that the Commission should conduct additional tests to determine if these proposals are feasible without producing interference. Press Broadcasting submitted an engineering statement indicating that the proposed subcarrier rules could harm reception of short-spaced stations. 19/ Press also expressed concern about the potential of certain audio processing techniques to degrade reception and increase the potential for adjacent channel interference.

33. Telocator assumed that the proposals contained in the Notice would only permit non-broadcast use of subcarriers. This led it to argue that the Commission could be foreclosed from adopting rules designed to allow the operation of more FM stations if these stations were found to have a harmful impact on non-broadcast subcarrier services. 20/ It reasoned that the operation of additional stations would deleteriously affect these services forcing the Commission to abandon its attempts to increase the number of FM stations.

34. Before proceeding to a discussion of each of the three technical proposals, we will address Telocator's more general technical comments. Contrary to Telocator's assumption, the Notice did not propose to permit only non-broadcast use of subcarriers. Paragraph 23 of the Notice clearly stated that "there is no reasonable basis for differentiating between subcarrier SCA services and subcarriers used to enhance main channel programming." 21/ The Notice proposed to allow licensees to use subcarriers to provide any desired lawful service. This could be either a broadcast or non-broadcast subcarrier service, or an enhancement of the main channel service (e.g. quadraphonic broadcasts, receiver switching, noise reduction companding signals). In any case, we must point out that subcarrier services are secondary to main channel services and are furnished at the option of the

19/ Short-spaced stations are those licensed prior to November 16, 1964, that do not meet the minimum distance separations adopted in the First Report and Order in Docket No. 14185.

20/ The Commission adopted a Notice of Proposed Rule Making in BC Docket No. 80-90 seeking comments on changes in the FM allotment and assignment rules designed to permit the operation of additional stations.

21/ Thus, the proposals in the Notice encompassed those being considered in Docket No. 21310 (FM quadraphonic broadcasting).

licensee. As such they would not be permitted to preclude the allotment of additional stations.

35. Expansion of the FM Baseband -- Most of the commenting parties supported expanding the FM baseband available for subcarriers. The proposal was based on information received in response to the Commission's proceeding in Docket No. 21310 exploring the desirability of permitting FM quadrasonic broadcasting. 22/ Based on the response of the comments and the technical information before us in the quad proceeding, we believe the upper baseband limit can be increased without causing the radiated signal to exceed the bandwidth limitations of the present rules. Therefore, we are expanding the usable subcarrier baseband to permit instantaneous sidebands up to 99 kHz since it was demonstrated to be fully feasible in Docket 21310.

36. The importance of this amendment cannot be underestimated. It will permit stations to offer two or more subcarriers for any legal purpose. One potential subcarrier service mentioned in the Notice was that of program enhancement (i.e., quadrasonic programming, pilot signals for receiver and recorder switching). Recognizing that these services have not previously been permitted, we call attention to the Commission's decision in the Report and Order in Docket No. 21313 (AM stereophonic broadcasting). There, the Commission found that the public interest did not require the establishment of specific technical standards for that particular service. Similarly, program enhancement services provided by subcarriers shall only be subject to the limitations applicable to all subcarrier transmissions and no technical standards promoting uniformity shall be considered or adopted by the Commission. 23/

37. Modulation Levels --- ABC, Westinghouse, and Bonneville argue that many FM stations do not provide subcarrier services because of the necessary penalty of reducing the program audio level at the listener's

22/ See Memorandum Opinion and Order and Notice of Proposed Rule Making in Docket No. 21310 (FCC 80-434, 45 Fed. Reg. 55411, August 20, 1980). This document sought comments on the desirability of amending the broadcast rules to permit FM broadcast stations to transmit a discrete quadrasonic signal. One aspect of this proposal was to permit a subcarrier at 95 kHz at an injection level of 10%. The information received in response indicated fully satisfactory operation with no impact on either main channel signals or those of adjacent channel stations.

23/ This action effectively terminates the proposal under consideration in Docket No. 21310 to specify standards for the transmission of quadrasonic signals. We shall terminate that proceeding without action in the near future to reflect today's actions.

receiver when subcarriers are transmitted. 24/ Westinghouse suggested that the overall modulation level could be extended even further than the 110% limit the Commission proposed. It submitted data to indicate modulation could be as high as 114% when two subcarriers are used and 105% when one subcarrier is used, thereby permitting the main program modulation to reach 95%. The technical comments of both Westinghouse and NPR show that the use of baseband subcarriers up to 99 kHz with total modulation for stereophonic programming and two subcarrier services up to 115% would conform to the occupied radio frequency bandwidth limits given in the Commission's rules.

38. On the other hand, the Consumer Electronics Group of the Electronic Industries Association ("EIA") expressed concern that changing the FM baseband and modulation standards could have an adverse effect on the quality of program reception. In particular, EIA reported it tested one receiver that operated satisfactorily for co-channel and first adjacent channel reception but suffered 3 dB degradation in reception from a second adjacent channel signal having two subcarriers and a total carrier modulation of 110%. Westinghouse did not provide any receiver measurement data to support its proposals while NPR submitted limited tests on a single receiver. It indicated slight degradation in adjacent channel operation. 25/ NPR stated that since more tests would be needed to determine the practical effect of the proposed modulation rules as subcarriers are added, it will continue its test program in an effort to document the state of the art in FM subcarrier transmission.

39. Based on the foregoing, we will not increase the modulation limit at this time. We believe that the rules could be amended to permit modulation levels above 100% when subcarriers are transmitted, without causing stations to occupy excessive bandwidth or degrading service (assuming a 99 kHz baseband). In many instances, listeners experiencing slightly degraded reception can correct it by improving or adjusting their receiving antennas. However, we cannot conclusively quantify the potential for such degradation from the brief receiver measurement data furnished. We believe that we should have more information to respond to concerns about the actual potential for reception degradation, even though slight. By a separate Order, therefore, the Mass Media Bureau will reopen the record in this proceeding for the limited purpose of obtaining additional information on two specific issues:

24/ The Commission is well aware of the efforts of many commercial station licensees to produce and maintain competitive loud program signals through the use of multiband audio processors, equalizers, composite clippers, reverberation effects, and similar devices. See "Radio, the Louder and the Better;" Broadcasting; November 17, 1980; pp 42-48.

25/ NPR's tests used a modified form of a measurement method recently adopted by the International Electrotechnical Commission using weighted noise. However, as it reported, the signal used for modulation of the main program channel may not represent the highly processed and limited dynamic range signals broadcast by some U.S. stations.



- (a) the degree of reception degradation caused by adjacent channel stations using peak modulation exceeding 100%; and
- (b) whether short-spaced stations would suffer adjacent channel interference to any greater extent than normally spaced stations.

In this manner we shall accommodate those commenters that sought additional testing before modifying the rules. Unless we receive conclusive documentation that there would be substantive degradation in service from increasing the permitted peak modulation to 110%, or 115% as suggested by Westinghouse, we will so amend the rules in a Second Report and Order. 26/

26/ Bonneville suggested that the Commission's traditional method of defining and limiting FM broadcast modulation in terms of maximum peak carrier deviation, forces stations transmitting contemporary rock music to use distortion producing audio processing to fully use the available modulation for comparative signal coverage. Bonneville argued that we should base our modulation limits on "statistical occupied bandwidth" criteria, thus preserving the dynamic range of program material. This method for limiting modulation would provide adjacent channel interference protection based on the spectral distribution of sideband energy rather than on peak sideband amplitudes. Bonneville stated that European FM stations use the occupied bandwidth criteria for determining operating levels, allowing a higher quality of audio signal to be transmitted without degradation from audio processing. No reply comments analyzed Bonneville's suggestions.

We have not analyzed them either for we believe they are beyond the scope of the Notice. Nonetheless, we must note our initial reaction. The present rules may be overly restrictive in placing a firm modulation limit on transient peaks that occur in loud passages of some program material, but any change from this measurement method would necessitate a full exploration of how modulation specifications affect FM receiver performance and adjacent channel interference. Further, because many stations use equipment to produce a competitively "loud" signal under present regulations, we expect that processing equipment would be developed that would again maximize loudness while conforming the radiated signal to whatever band limitations may be established as an alternative to the present ones.

The types of regulations applicable to state-operated national broadcast systems in certain European countries are not applicable in the U.S. where some commercial stations are concerned with the competitive loudness of their program material. Bonneville's contention, that FM stations do not offer subcarrier services because of the potential loss in loudness, cannot be resolved by converting to an occupied bandwidth method of regulating modulation levels. This method would be no more effective than changing the maximum permitted deviation limits for subcarrier operation under the present procedures.

40. Subcarrier Modulation Using Frequency Modulation Only --- The Commission requested comments on the proposal to remove the restriction that subcarriers be frequency modulated. Previously the rules were based on the assumption that conventional music or voice services would be provided via subcarriers. Additionally, the rules provided for the transmission of "visual" subcarrier services. In this context, visual material means all forms of data, telemetry, facsimile, or control signals that are used in any form other than a reproduced audio service. Whenever an applicant requested authorization to provide a non-aural subcarrier service, detailed test data had to accompany the application showing that the transmitted signal conformed to the baseband crosstalk and bandwidth limitation requirements.

41. We recognize that many of the non-aural services that may be provided by the FM broadcast subcarrier would require modulation more closely related to either frequency shift keying or a form of pulse modulation. On the other hand, use of the subcarrier for quadraphonic programming would involve forms of amplitude modulation, similar to the techniques now used for the stereophonic service. While we received no information that indicates there would be any problems with using other types of subcarrier modulation, greater attention to monitoring and controlling the subcarrier signal and its injection level is required. We are therefore removing the restriction that only FM modulation of the subcarrier be used.

42. Further, we are amending the modulation monitoring requirements to note that type approved monitors will not be required in certain circumstances. These monitors are not now designed for operation above 75 kHz or for non-FM subcarriers. Therefore, until the Commission concludes the proceeding in BC Docket No. 81-698, which is reviewing all modulation monitoring requirements, licensees may use any type of suitable measuring equipment to guarantee their subcarrier signals conform to the limitations on the intra-baseband crosstalk, adjacent channel sideband energy, and total peak carrier deviation. In this regard, we note that NPR and others report that alternative calibration methods are easily implemented.

43. Other Technical Matters --- Other issues of a hybrid nature were addressed by the comments. The Commission stated in the Notice that Mexico would have to agree with the changes in technical provisions for subcarrier uses before stations located within 320 km (199 miles) of the common border could operate under the revised rules. This is in recognition of the limitation in the Agreement which restricts use of the FM baseband to 75 kHz. The U.S.-Canada FM Broadcasting Agreement does not contain such a restriction in the use of the baseband. However, out of concern that the changes in the technical provisions being proposed could alter the bases upon which allotments are made under the Agreement with Canada, it was indicated in the Notice that concurrence of the Canadian Department of Communications would be requested before permitting stations within 320 km (199 miles) of the common border to transmit under the revised rules.

44. We have not as yet contacted the Mexican Director General of Telecommunications. Thus, stations located within 199 miles of Mexico can commence using subcarriers under the revised rules only within the existing

baseband between 20 and 75 kHz. Operations above 75 kHz may not begin until Article 3 of the Mexico-United States FM Broadcasting Agreement is modified. We will undertake appropriate steps with Mexico to accomplish this step.

45. During the course of this proceeding we have determined that the changes under these revised rules will not alter the bases under which allotments are made under the terms of the U.S.-Canada FM Broadcasting Agreement. Now that we are able to find that stations operating under the revised rules within 199 miles of Canada will be operating in conformity with that Agreement, Canadian approval is unnecessary. Therefore, there is no need to delay commencement of such operation. As part of our ongoing coordination with the Canadian Department of Communications we will apprise them of the changes to our rules as a matter of courtesy.

46. Family Stations, Inc. encouraged the Commission to address the issue of variable tuned FM subcarrier receivers. It asked that the Commission not place special restrictions on their manufacture and/or sale to the public. If such receivers were available, it contended, broadcasters would be more likely to provide broadcast service via subcarriers to underserved audiences than in providing subcarrier service to limited segments of the public. This concept is clearly beyond the scope of this proceeding.

47. Under the rules being adopted by this Report and Order, licensees will no longer be required to file technical measurements with an application for an authorization to transmit "visual" communications via a subcarrier. We also are not requiring the subcarrier generator-modulator unit of the transmission system to be type accepted or otherwise specifically authorized for use. The licensee of each FM station engaging in subcarrier services is responsible for determining that the transmission system meets the technical requirements for such operation, whether the subcarrier generator is connected directly to the transmitter or connected to a microwave transmitter for composite baseband studio transmitter link. Stations installing subcarrier transmission equipment need not file the equipment performance measurement data with the FCC, but retain them at the station for future reference.

48. The only restriction on the use of subcarrier generating equipment is that it must not require either mechanical or electrical changes in the circuits of type accepted transmitters designed for subcarrier operations. This requirement should create no problems because modern FM transmitters are designed to accommodate subcarrier generating equipment.

49. Because we are no longer issuing subcarrier authorizations specifying the subcarrier frequencies to be used, the rule requiring that subcarriers be maintained within 500 kHz of the authorized frequency is being deleted. We are also deleting the restriction that subcarriers cannot be used to turn main channel receivers on and off. This latter rule was adopted at a time when stations were using their main broadcast program facility to provide functional music services. At this time, licensees may find that subcarrier

transmission for receiver selection or switching may provide useful broadcast services, and the rules will no longer prohibit such operations.

#### D. Procedural Rule Proposals

50. The Notice proposed two procedural rule proposals: (a) the elimination of "program" log requirements for subcarrier operations; and (b) the elimination of the requirement for a formal SCA application (Form 318). Virtually all parties favor the procedural rule proposals contained in the Notice. However, the University of Kansas Audio-Reader Network and the Minnesota Radio Talking Book Network urge the Commission to maintain subcarrier applications and program logs as a means through which the Commission can measure subcarrier use. In addition, the American Foundation for the Blind contends that if reservation of a subcarrier for public telecommunication services is required, then the Commission must have a means of monitoring that process. Therefore, it proposed retaining a simple application form. Amaturio Group, Inc. favors the elimination of applications and logs. However, if the Commission were to adopt Amaturio's suggestion that users of subcarriers for public paging purposes are allowed to elect whether they wish to offer their services on a common carrier regulated basis or on a non-common carrier regulated basis, then it believes that the Commission may find it useful to require such users to file a brief written notice of their election with the Commission. Such notification would permit Commission records to reflect those FM stations operating subcarriers dedicated to common carrier use.

51. We will not retain a program log requirement for FM subchannels. As indicated in the Notice, such a requirement would be consistent with our action in the Deregulation of Radio, 84 F.C.C. 2d 968 (1981), which eliminated program logs for the main channel operation of commercial radio stations. Moreover, in our companion action in BC Docket No. 82-1, we have declined to reserve a subchannel for public telecommunications services such as radio reading services. While it would be informative to have information on subchannel uses, including radio reading services, we do not believe it is appropriate to mandate a universal logging requirement for all subcarriers. Rather, if such information becomes necessary in either an individual situation or to evaluate future rule making proposals concerning subchannel use, the Commission can accumulate the necessary data through industry sources, individual licensee records or a special survey. Thus, we will not impose a logging requirement on licensees utilizing FM subchannels.

52. The Commission will also eliminate the requirement for a formal SCA application (Form 318). As we stated in the Notice, the need for information gleaned from Form 318 no longer exists. Specifically, we do not think there is a need to identify the manufacturer and model number of the subcarrier equipment, the subcarrier frequency to be used, the means to control multiplex receivers, or the amount of main channel programming that will be duplicated on a subcarrier channel. All audio rule requirements of Section 73.319 of the Commission's rules must be met in any case, and we believe this is sufficient to cover any concerns in this area. Moreover, we

do not believe that a simplified Form 318 is needed to monitor the types of services being offered. To the extent that such information is necessary to make judgments on the application of appropriate regulations, the requirement that the licensee seek a specific authorization to provide such services will suffice. See para. 26, supra.

#### IV. Conclusion

53. Our action today represents a major effort on the part of the Commission to ensure efficient FM spectrum utilization and to remove unnecessary burdens imposed on FM licensees due to overrestrictive rules. We believe that a wide variety of services of interest to the public will be served if subcarrier services are no longer bound to materials of a broadcast nature. The regulatory changes we are providing permit the broadcast industry greater flexibility to develop and offer services that specifically address the needs of individual applications and to alter these services in a manner consistent with the dynamic environment.

54. Accordingly, we shall amend our rules to: (1) permit the use of FM subchannels for any legitimate communications purpose whether broadcast related or not; (2) permit the operation of subchannels even when the main channel is not in operation; (3) expand the FM baseband to 99 kHz except for stations within 200 miles of the Mexican border; (4) permit modulation of subcarriers by any means, so long as there is no main channel interference; (5) eliminate the need to retain program logs for subcarrier operation; and (6) eliminate the subcarrier application form, FCC Form 318.

55. Pursuant to the Regulatory Flexibility Act of 1980, the Commission's final analysis is as follows:

##### I. Need for and Purpose of the Rules.

The Commission has concluded that permitting subcarrier operation on a 24 hour-per-day basis, permitting materials of a non-broadcast nature to be offered on subcarrier channels and expanding the FM baseband, thereby permitting two subcarrier channels would enhance the public interest by providing opportunities for extending and diversifying subcarrier service and for improving the efficiency of spectrum utilization.

##### II. Summary of issues raised by public comments in response to the initial regulatory flexibility analysis, Commission assessment, and changes made as a result.

###### A. Issues raised.

1. No issues or concerns were raised specifically in response to the initial regulatory flexibility analysis. The issues of permitting two subcarriers on the FM baseband and allowing non-broadcast materials to be transmitted on subcarrier channels received favorable reactions. Some parties expressed concern that non-profit organizations could not compete with profit-making entities wishing to use the same subcarriers. Specifically, concern

was raised by radio reading services pertaining to access to subcarriers on public FM stations. This issue is resolved in the companion item, Docket No. 82-1.

2. Some commenters also suggested that nonbroadcast uses of subchannels would unfairly compete with traditional offerers of services like paging. They argue that, as proposed in the Notice, FM stations would not be subject to the same regulations as traditional pagers. They also argue that the superior technical facilities of FM stations would put them at a competitive disadvantage.

#### B. Assessment.

1. The Commission views the absence of specific claims of adverse impact with respect to its subcarrier proposals, with the exception of non-profit radio reading services on public FM stations, as indicative of their lack of potential for negative effects on small businesses. The issue of radio reading services on public FM stations is addressed in Docket No. 82-1.

2. The technical information before the Commission indicates that there may be situations in which a Class C FM station offers paging services on technical facilities that cover a wider area than traditional paging systems. However, it appears that these situations will be limited, and the spectrum efficiencies achieved by this action outweigh the potential competitive impact on existing paging systems.

#### C. Changes made as a result of such comments.

FM broadcasters offering subchannels for common carrier and/or private radio communications services will be subject to the same regulation as traditional offerers of such services.

### III. Significant Alternatives Considered and Rejected.

The Commission's other alternatives were: (1) not to authorize subcarrier operation at times other than when the main channel is operating; (2) not to authorize materials of a non-broadcast nature to utilize subcarrier channels; (3) maintain the current technical requirements governing subcarriers, thereby prohibiting operation of a second subcarrier channel; and (4) maintain the requirement to file subcarrier application Form 318 and maintain subcarrier program logs. To deny authorization of subcarrier operation on a 24-hour-per-day basis, to deny transmission of non-broadcast materials and to prohibit expansion of the FM baseband to accommodate a second subcarrier channel would be to forego the beneficial objectives sought in this rule making. To require subcarrier program logs be maintained is inconsistent with existing Commission policy that does not require program logs be kept for main channel operations. Finally, to require application Form 318 be maintained would only necessitate needless government paperwork. A more

restrictive approach to regulation likely would interfere with realization of the full potential and benefits of subcarrier operations and would represent an unnecessary intrusion by the government into the affairs of private businesses.

56. Authority for adoption of the rules contained herein is contained in Sections 2, 4(1), and 303 of the Communications Act of 1934, as amended.

57. Accordingly, IT IS ORDERED, That Parts 2 and 73 of the Commission's Rules ARE AMENDED as set forth in Appendix A, effective June 27, 1983.

FEDERAL COMMUNICATIONS COMMISSION

William J. Tricarico  
Secretary

Attachment: Appendix





## A P P E N D I X

1. Section 2.106 is amended by revising the National Table of Frequency Allocations for footnote designation NG128 in column 7 in the band 88-108 MHz, and the footnote NG128 as follows:

§2.106 Table of Frequency Allocations.

United States			Federal Communications Commission		
Band (MHz)	Allocation	Band (MHz)	Services	Class of	
Station					
5	6	7	8	9	* *
	*	*	*	*	
88-108	88-108	BROADCASTING	FM Broadcasting		
(US93)	(NG128) (NG129)		(NG2)		
	*	*	*	*	

NG128 In the band 535-1605 kHz, AM broadcast licensees or permittees may use the AM carrier on a secondary basis to transmit signals intended for utility load management. In the band 88-108 MHz, FM broadcast licensees or permittees are permitted to use subcarriers to transmit signals intended for broadcast and on a secondary basis for non-broadcast purposes.

\* \* \* \* \*

2. Section 2.1001 is amended by adding new paragraphs (i) and (j) to read as follows:

§2.1001 Changes in type accepted equipment.

\* \* \* \* \*

(i) The addition of FM broadcast subcarrier generators under the provisions of §§73.293, 73.319, and 73.1690 of Part 73 of the Rules to a type accepted FM broadcast transmitter is considered a Class I permissive change described in paragraph (b)(1) of this Section, provided the transmitter exciter is designed for subcarrier operation without mechanical or electrical alterations to the exciter or other transmitter circuits.

(j) The addition of FM stereophonic sound generators under the provisions of §§73.297, 73.597 and 73.1690 of Part 73 of the Rules to an FM broadcast transmitter type accepted for stereophonic operation is considered a Class I permissive change described in paragraph (b)(1) of this Section, provided the transmitter exciter is designed for stereophonic sound operation without mechanical or electrical alterations to the exciter or other transmitter



circuits.

3. Section 73.253 is amended by adding a note following subparagraph (a)(2) to read as follows:

§73.253 Modulation Monitors.

(a) \* \* \*

\* \* \* \* \*

(2) \* \* \*

Note. Until such time as the proceeding in BC Docket No. 81-698 addressing the requirements for modulation monitors is concluded, stations transmitting subcarriers within the range of 75-99-kHz, or using other than frequency modulation of the subcarrier(s) need not have a type approved subcarrier modulation monitor for such transmissions. Stations using subcarriers for which type approved modulation monitors are not available must have appropriate measuring equipment to determine that the subcarrier injection levels and modulation conforms to the limitations in this Part for such transmissions.

\* \* \* \* \*

4. Section 73.277 is amended by revising paragraph (b) to read as follows:

§73.277 Permissible transmissions.

(a) \* \* \*

(b) The transmission (or interruption) of radio energy in the FM broadcast band is permissible only pursuant to a station license, program test authority, construction permit, or experimental authorization and the provisions of this Part of the Rules.

5. Section 73.293 is revised in its entirety to read as follows:

§73.293 Use of FM multiplex subcarriers.

Licensees of FM broadcast stations may transmit without further authorization from the FCC subcarriers within the composite baseband signals for the following purposes:

(a) Stereophonic (biphonic, quadrasonic, etc.) sound programs under the provisions of §§73.297 or 73.597.

(b) Transmission of signals relating to the operation of FM stations such as relaying broadcast materials to other stations, remote cueing and order messages, and control and telemetry signals for the transmitting system.



(c) Transmission of pilot or control signals to enhance the station's program service such as those to activate noise reduction decoders in receivers, for program alerting and program identification.

(d) Subsidiary communications services.

6. Section 73.294 is removed in its entirety.

7. Section 73.295 is revised in its entirety to read as follows:

§73.295 FM subsidiary communications services.

(a) Subsidiary communications services are those transmitted on a subcarrier within the FM baseband signal, but do not include services which enhance the main program broadcast service (see §73.293(a)(d)) or exclusively relate to station operations (see §73.293(c)). Subsidiary communications include, but are not limited to services such as functional music, specialized foreign language programs, radio reading services, utility load management, market and financial data and news, paging and calling, traffic control signal switching, bilingual television audio, and point to point or multipoint messages.

(b) FM subsidiary communications services that are common carrier in nature are subject to common carrier regulation. Licensees operating such services are required to apply to the FCC for the appropriate authorization and to comply with all policies and rules applicable to the service. Responsibility for making the initial determinations of whether a particular activity is common carriage rests with the FM station licensee. Initial determinations by licensees are subject to FCC examination and may be reviewed at the FCC's discretion.

(c) Subsidiary communications services are of a secondary nature under the authority of the FM station authorization, and the authority to provide such communications services may not be retained or transferred in any manner separate from the station's authorization. The grant or renewal of an FM station permit or license is not furthered or promoted by proposed or past services. The permittee or licensee must establish that the broadcast operation is in the public interest wholly apart from the subsidiary communications services provided.

(d) The station identification, delayed recording, and sponsor identification announcements required by §73.1201, 73.1208, and 73.1212 are not applicable to leased communications services transmitted via subcarriers that are not of a general broadcast program nature.

(e) The licensee or permittee must retain control over all material transmitted in a broadcast mode via the station's facilities, with the right to reject any material that it deems inappropriate or undesirable.

(f) A daily record of the use of subcarrier transmissions used for subsidiary communications services exceeding 15 minutes duration, showing the



time the subcarrier modulation is turned on and off must be entered in the station operating log.

8. Section 73.297 is amended by revising the headnote and paragraph (a) to read as follows:

§73.297 FM stereophonic sound broadcasting.

(a) An FM broadcast station may, without specific authority from the FCC, transmit stereophonic (biphonic, quadrasonic, etc.) sound programs upon installation of stereophonic sound transmitting equipment under the provisions of §§2.1001, 73.322, and 73.1590 of the Rules. Prior to commencement of stereophonic sound broadcasting, equipment performance measurements must be made to ensure that the transmitted signal complies with all applicable rules and standards.

\* \* \* \* \*

9. Section 73.310 is amended by:

Revising the headnote.

In paragraph (a) adding a new definition "Composite baseband signal."

In paragraph (b) revising the headnote; removing the definitions "Stereophonic Subcarrier" and "Stereophonic subchannel;" revising the definitions "Pilot subcarrier" and "Stereophonic Separation;" and adding the definitions "Stereophonic sound subcarrier" and "Stereophonic sound subchannel."

Revising paragraph (c).

Adding new paragraph (d).

§73.310 FM broadcast technical definitions.

(a) \* \* \*

\* \* \* \* \*

Composite baseband signal. A signal which is composed of all program and other communications signals that frequency modulates the FM carrier.

\* \* \* \* \*

(b) Stereophonic sound broadcasting.

\* \* \* \* \*

Pilot subcarrier. A subcarrier that serves as a control signal for use in the reception of FM stereophonic sound broadcasts.

Stereophonic separation. The ratio of the electrical signal caused in sound channel A to the signal caused in sound channel B by the transmission of only a channel B signal. Channels A and B may be any two channels of a stereophonic sound broadcast transmission system.





Stereophonic sound. The audio information carried by plurality of channels arranged to afford the listener a sense of the spatial distribution of sound sources. Stereophonic sound broadcasting includes, but is not limited to, biphonic (two channel) and quadrophonic (four channel) services.

Stereophonic sound subcarrier. A subcarrier within the FM broadcast baseband used for transmitting signals for stereophonic sound reception of the main broadcast program service.

Stereophonic sound subchannel. The band of frequencies from 23 kHz to 99 kHz containing sound subcarriers and their associated sidebands.

Stereophonic subcarrier. [Removed.]

Stereophonic subchannel. [Removed.]

(c) Visual transmissions. Communications or message transmitted on a subcarrier intended for reception and visual presentation on a viewing screen, teleprinter, facsimile printer, or other form of graphic display or record.

(d) Control and telemetry transmissions. Signals transmitted on a multiplex subcarrier intended for any form of control and switching functions or for equipment status data and aural or visual alarms.

10. Section 73.319 is amended in its entirety to read as follows:

§73.319 FM multiplex subcarrier technical standards.

(a) The technical specifications in this Section apply to all transmissions of FM multiplex subcarriers except those used for stereophonic sound broadcasts under the provisions of §73.322.

(b) Modulation. Any form of amplitude modulation, (DSB, SSB, etc.), angle modulation (FM or PM), or frequency shift keying of a multiplex subcarrier or any combination thereof may be used.

(c) Subcarrier baseband.

(1) During monophonic program transmissions, multiplex subcarriers and their significant sidebands must be within the range of 20 kHz to 99 kHz.

(2) During stereophonic sound program transmissions (see §73.322), multiplex subcarriers and their significant sidebands must be within the range of 53 kHz to 99 kHz.

(3) During periods when broadcast programs are not being transmitted, multiplex subcarriers and their significant sidebands must be within the range of 20 kHz to 99 kHz.

Note. Stations with transmitter sites located within 320 kilometers (199 miles) of the common United States-Mexico border may use subsidiary communications subcarriers only within the range of 20 kHz to 75 kHz until such time as the Commission issues a notice that the



bilateral agreement with Mexico on FM Broadcasting is amended to permit use of subcarriers to 99 kHz.

(d) Subcarrier injection.

(1) During monophonic program transmissions, modulation of the carrier by the arithmetic sum of all subcarriers above 75 kHz may not exceed the carrier by more than 10%, and modulation of the carrier by the arithmetic sum of all subcarriers may not exceed 30%, referenced to 75 kHz deviation.

(2) During stereophonic sound program transmissions, modulation of the carrier by the arithmetic sum of subcarriers above 75 kHz may not exceed 10%, and modulation of the carrier by the arithmetic sum of all subcarriers may not exceed 10%, referenced to 75 kHz deviation.

(3) Reserved.

(4) During periods when no broadcast program service is transmitted, modulation of the carrier by the arithmetic sum of all subcarriers above 75 kHz may not exceed 10%, and modulation of the carrier by the arithmetic sum of all subcarriers may not exceed 30%, referenced to 75 kHz deviation.

(e) Cross-talk noise.

(1) During monophonic program transmissions, the cross-talk within the main program channel (50 Hz to 15,000 Hz) caused by communications subcarriers must be at least 60 dB (measured as RMS noise) below 100% modulation reference.

(2) During stereophonic sound program transmissions, the cross-talk within the range of 50 Hz to 53,000 Hz caused by communications subcarriers must be at least 60 dB (measured as RMS noise) below 100% modulation reference.

(f) The use of multiplex subcarriers may not cause the radiated signal to exceed the band limitations specified in §73.317(a)(12) and (13).

(g) Subcarrier generators may be installed and used with a type accepted FM broadcast transmitter without specific authorization from the FCC provided the generator can be connected to the transmitter without requiring any mechanical or electrical modifications in the transmitter FM exciter circuits.

(h) Stations installing multiplex subcarrier transmitting equipment must make such equipment performance measurements as necessary to determine compliance with the provisions of this Section. If the method of subcarrier modulation being used causes the station's transmission to not comply with the provisions of this Section or causes harmful interference to other communications services, the FCC may require the licensee to correct the problem and verify the results by measurements. Reports of measurement data are to be retained at the station and made available to the FCC upon request.

(i) Stations transmitting subsidiary communications subcarriers must have the facilities at the transmitter control point to determine that the transmissions are in compliance with all applicable rules and policies.



11. Section 73.322 is amended by revising the headnote and paragraphs (f), (i), (j), (n), (o), (p) and (q); and deleting the note following paragraph (m) as follows:

§73.322 FM stereophonic sound transmission standards.

\* \* \* \* \*

(f) Stereophonic sound subcarriers must be capable of accepting audio frequencies from 50 Hz to 15,000 Hz.

\* \* \* \* \*

(i) The following modulation levels apply to stereophonic sound transmissions:

(1) When a signal exists in only one channel of a two channel (biphonic) sound transmission, modulation of the carrier by audio components within the baseband range of 50 Hz to 15,000 Hz may not exceed 45% and modulation of the carrier by the sum of the amplitude modulated subcarrier in the baseband range of 23 kHz to 53 kHz may not exceed 45%.

(2) When a signal exists in only one channel of a stereophonic sound transmission having more than one stereophonic subcarrier in the baseband, the modulation of the carrier by audio components within the audio baseband of 50 Hz to 15,000 Hz may not exceed 37% and modulation of the carrier by the sum of all subchannel components within the baseband range of 23 kHz to 99 kHz may not exceed 53%.

(j) Total modulation of the main carrier including pilot subcarriers and all stereophonic sound subcarriers must comply with the requirements of §73.1570 with the maximum modulation of the main carrier by all subsidiary communications subcarriers limited to 10%.

\* \* \* \* \*

(n) The separation between any two channels of a stereophonic transmission system must exceed 29.7 dB for all audio modulating frequencies between 50 Hz and 15,000 Hz. This separation will indicate compliance with paragraphs (1) and (m) of this Section.

(o) Non-linear cross-talk into the main program channel caused by signals in the stereophonic broadcast subchannel must be attenuated at least 40 dB (measured as RMS noise) below 90% modulation. Non-linear cross-talk into the stereophonic broadcast subchannels caused by signals in the main channel must be attenuated at least 40 dB (measured as RMS noise) below 90% modulation. (Non-linear cross-talk does not include effects of phase delay differences in program audio circuits. These effects are represented by loss of channel separation, and also by amplitude distortion in the monophonic reception of stereophonic programs.)

(p) Equipment performance measurements procedures (see §73.1690) for stereophonic operation have not been established. However, when measurements



are required for stereophonic equipment under the provisions of this Part, measurement data must be obtained to demonstrate compliance with this Section.

(q) The transmitter performance standards of §73.317(a)(2), (3), (4), and (5) apply to the main channel and stereophonic subchannels alike, except that the 100% reference modulation level includes the pilot subcarrier.

Note Stations with transmitter sites located within 320 kilometers (199 miles) of the common United States-Mexico border may use multichannel sound subcarriers only within the range of 23 kHz to 75 kHz until such time as the Commission issues a notice that the bilateral agreement with Mexico on FM Broadcasting is amended to permit use of multiplex subcarriers in the band 75-99 kHz.

12. Section 73.332 is amended by revising the headnote and paragraph (a) and adding a new Note following paragraph (g) to read as follows:

§73.332 Requirements for type approval of FM modulation monitors.

(a) Procedures for obtaining type approval of FM modulation monitors are contained in §73.1668 and Subpart J of Part 2 of the FCC Rules.

\* \* \* \* \*

Note. Until such time as the Commission concludes the proceeding in Docket 81-698 concerning the requirements for modulation monitors, no standards are established for monitors for stereophonic sound transmissions using subcarrier sidebands above 53 kHz, for subsidiary communications multiplex subcarriers between 75 kHz and 99 kHz or for subcarriers using other than frequency modulation. Although type approval of modulation monitors for transmissions of such subcarriers are not required, licensees transmitting such subcarriers are required to have appropriate modulation measuring equipment to ensure that the transmissions comply with the provisions of §§73.319, 73.322 and 73.1570(b).

13. Section 73.342 is amended by revising paragraphs (c) and (j) to read as follows:

§73.342 Automatic transmission system facilities.

\* \* \* \* \*

(c) If the station transmits subsidiary communications using multiplex subcarriers, the transmission system must be equipped with automatic limiting devices to prevent excessive modulation of the subcarriers.

\* \* \* \* \*

(j) An FM station may use multiplex subcarriers for automatic transmission system telemetry in accordance with the technical provisions of §73.319 and upon installation of appropriate equipment for measuring the subcarrier modulation and injection level.





14. Section 73.346 is amended by revising subparagraph (b)(2) to read as follows:

§73.346 Automatic transmission system monitoring and alarm points.

\* \* \* \*

(b) \* \* \*

(1) \* \* \*

(2) An off-air receiver for monitoring the station's program signal and any subsidiary communications transmitted by means of multiplex subcarriers.

\* \* \* \*

15. Section 73.542 is amended by revising paragraphs (c) and (j) to read as follows:

§73.542 Automatic transmission system facilities.

\* \* \* \*

(c) If the station transmits subsidiary communications by using multiplex subcarriers, the transmission system must be equipped with automatic limiting devices to prevent excessive modulation of the subcarriers.

\* \* \* \*

(j) An FM station may use multiplex subcarriers for automatic transmission system telemetry in accordance with the technical provisions of §73.319 and upon installation of appropriate equipment for measuring the subcarrier modulation and injection level.

16. Section 73.546 is amended by revising subparagraph (b)(2) to read as follows:

§73.546 Automatic transmission system monitoring and alarm points.

\* \* \* \*

(b) \* \* \*

(1) \* \* \*

(2) An off air receiver for monitoring the station's program signal and any subsidiary communications transmitted by means of multiplex subcarriers.



\* \* \* \* \*

17. Section 73.553 is amended in its entirety to read as follows:

**§73.553 Modulation monitors.**

(a) The provisions of §73.254 apply to noncommercial educational FM stations authorized to operate with transmitter output power exceeding 0.1 kW.

(b) The licensee of each noncommercial educational FM station licensed to operate with powers of 0.1 kW or less must provide an operating percentage modulation indicator or a calibrated program level meter from which the total percentage of modulation of the transmitter can be determined and maintained by the station duty operator.

18. Section 73.594, Nature of the SCA, is removed in its entirety.

19. Section 73.595, Use of multiplex subcarriers, is removed in its entirety.

20. Section 73.597 is amended by revising the headnote and paragraph (a) to read as follows:

**§73.597 FM stereophonic sound broadcasting.**

(a) A noncommercial educational FM broadcast station may, without specific authority from the FCC, transmit stereophonic sound programs upon installation of stereophonic sound transmitting equipment under the provisions of §§2.1001, 73.322, and 73.1590 of the Rules. Prior to commencement of stereophonic sound broadcasting, equipment performance measurements must be made to ensure that the transmitted signal complies with all applicable rules and standards.

\* \* \* \* \*

21. Section 73.1207 is amended by revising subparagraph (b)(2) to read as follows:

**§73.1207 Rebroadcasts.**

\* \* \* \* \*

(b) \* \* \*

(1) \* \* \*

(2) Permission must be obtained from the originating station to rebroadcast any subsidiary communications transmitted by means of a multiplex subcarrier or the vertical blanking interval of a television signal.



\* \* \* \* \*

22. Section 73.1225 is amended by revising subparagraph (c)(2)(i) and adding new subparagraph (c)(2)(iii) to read as follows:

§73.1225 Station inspections by the FCC.

\* \* \* \* \*

(c) \* \* \*

\* \* \* \* \*

(2) \* \* \*

(i) Equipment performance measurements as required by §73.1590.

\* \* \* \* \*

(iii) Measurement data taken upon installation of subsidiary communications multiplex subcarrier generators showing compliance with the crosstalk and bandwidth limitation as required by §73.293(a) and 73.1690.

\* \* \* \* \*

23. Section 73.1226 is amended by revising paragraph (c) to read as follows:

§73.1226 Availability to FCC of station logs and records.

\* \* \* \* \*

(c) The following contracts, agreements, or understandings, which need not be filed with the FCC (per §73.3613, Filing of contracts), must be kept at the station and made available for inspection by any authorized representative of the FCC upon request:

(1) Contracts relating to the sale of broadcast time to "time brokers" for resale.

(2) FM subchannel leasing agreements for subsidiary communications.

(3) Time sales contracts with the same sponsor for 4 or more hours per day, except where the length of the events (such as athletic contests, musical programs, and special events) broadcast pursuant to the contract is not under control of the station.

(4) Contracts with chief operators or other engineering personnel.

24. Section 73.1570 is amended by revising subparagraph (b)(2) to read as follows:

§73.1570 Modulation levels: AM, FM, and TV aural.



\* \* \*

(2) \* \* \*

(i) FM stations transmitting stereophonic sound programs must comply with the modulation specifications of paragraphs (b), (i), and (j) of §73.322.

(ii) FM stations transmitting multiplex subcarriers for other than stereophonic sound broadcasting must comply with the carrier modulation specifications of §73.319(d).

25. Section 73.1690 is amended by revising paragraph (e)(4) and adding new subparagraph (e)(7) to read as follows:

§73.1690 Modification of transmission systems.

(e) \* \* \*

(4) Installation or replacement of an FM stereophonic sound generator provided the generator can be connected to the type accepted transmitter without requiring any mechanical or electrical changes in the transmitter FM exciter circuits.

(7) Installation or replacement of an FM subsidiary communications generator provided the generator can be connected to a type accepted transmitter without requiring any mechanical or electrical changes in the transmitter FM exciter circuits.

26. SECTION 73.1830 AMENDED.

Section 73.1830, Maintenance logs, is amended by removing subparagraph (a)(3)(iii) in its entirety.

27. SECTION 73.3500 AMENDED.

Section 73.3500 is amended by removing from the listing of FCC forms reference to FCC Form 318 - Request for Subsidiary Communications Authorization.





28, Section 73.3533 is amended by removing subparagraph (a)(4) and marking it "Reserved."

§73.3533 Application for construction permit or modification of construction permit.

(a) \* \* \*

\* \* \* \* \*

(4) [Reserved.]

\* \* \* \* \*

29, Section 73.3536 is amended by removing subparagraph (a)(4) and marking it "Reserved."

§73.3536 Application for license to cover construction permit.

(a) \* \* \*

\* \* \* \* \*

(4) [Reserved.]

\* \* \* \* \*

30. Section 73.3613 is amended by revising paragraph (d) to read as follows:

§73.3613 Filing of contracts.

\* \* \* \* \*

(d) The following contracts, agreements, or understandings, which need not be filed with the FCC, must be kept at the station and made available for inspection by any authorized representative of the FCC upon request:

(1) Contracts relating to the sale of broadcast time to "time brokers" for resale.

(2) FM subchannel leasing agreements for subsidiary communications.

(3) Time sales contracts with the same sponsor for 4 or more hours per day, except where the length of the events (such as athletic contests, musical programs, and special events) broadcast pursuant to the contract is not under control of the station.

(4) Contracts with chief operators or other engineering personnel.

\* \* \* \* \*



31. Section 73.4093, Discrete (encoded) 4-channel stereo transmission authority, is removed in its entirety.

32. Section 73.4126 is amended by revising the headnote to read as follows:

§73.4126 Horse racing information transmitted via FM broadcast subcarriers.

\* \* \* \* \*

33. The alphabetical index to Part 73 of the Rules is amended by deleting the following entries:

\* \* \* \* \*

Authorizations, Subsidiary Communications.

\* \* \* \* \*

Authorizations, Subsidiary Communications, Operation under

\* \* \* \* \*

Engineering standards, Subsidiary communications multiplex operations (FM)

\* \* \* \* \*

Multiplex operations, Subsidiary communications, engineering standards (FM)

\* \* \* \* \*

Multiplex subcarriers, Use of

\* \* \* \* \*

Operation Under Subsidiary Communications Authority (SCA)

\* \* \* \* \*

Transmission standards, Stereophonic (FM)

\* \* \* \* \*

Stereophonic broadcasting

\* \* \* \* \*

Stereophonic transmission standards (FM)

\* \* \* \* \*



## Subsidiary Communications Authorizations (SCA)

\* \* \* \* \*

## Subsidiary Communications Authorizations, Nature of

\* \* \* \* \*

## Subsidiary Communications Authorizations, Operation Under

\* \* \* \* \*

## Subsidiary Communications multiplex operations: engineering standards (FM)

\* \* \* \* \*

## Use of multiplex subcarriers

\* \* \* \* \*

34. The alphabetical index to Part 73 of the Rules is amended by adding the following listings in sequence:

\* \* \* \* \*

## Communications services, Subsidiary

FM.....73.295  
NCE-FM.....73.593

\* \* \* \* \*

FM multiplex subcarrier technical standards.....73.319

FM multiplex subcarriers, Use of.....73.293

FM subsidiary communications services.....73.295

\* \* \* \* \*

Multiplex subcarriers, Use of FM.....73.293

\* \* \* \* \*

## Stereophonic sound broadcasting:

FM.....73.297  
NCE-FM.....73.597

Stereophonic sound transmission standards, FM.....73.322

\* \* \* \* \*

Subcarrier, FM multiplex, technical standards.....73.319



	*	*	*	*	*
Subsidiary communications services					
FM.....					73.295
NCE-FM.....					73.593
	*	*	*	*	*
Technical standards, FM multiplex subcarrier.....					73.319
	*	*	*	*	*
Transmission standards, FM Stereophonic sound.....					73.322
	*	*	*	*	*
Use of FM multiplex subcarriers.....					73.293
	*	*	*	*	*

